

What is claimed is:

1. A method for diagnosing the presence of breast cancer in a patient comprising:

(a) measuring levels of BSG in cells, tissues or bodily fluids in said patient; and

(b) comparing measured levels of BSG with levels of BSG in cells, tissues or bodily fluids from a normal human control, wherein a change in measured levels of BSG in the patient versus normal human control is associated with the presence of breast cancer.

2. A method of diagnosing metastatic breast cancer in a patient having breast cancer comprising:

(a) identifying a patient having breast cancer that is not known to have metastasized;

(b) measuring levels of BSG in a sample of cells, tissues, or bodily fluid from said patient; and

(c) comparing the measured BSG levels with levels of BSG in cells, tissue, or bodily fluid type of a normal human control, wherein a change in measured BSG levels in the patient versus the normal human control is associated with a cancer which has metastasized.

3. A method of staging breast cancer in a patient comprising:

(a) identifying a patient having breast cancer;

(b) measuring levels of BSG in a sample of cells, tissues, or bodily fluid from said patient for BSG; and

(c) comparing measured BSG levels with levels of BSG in cells, tissues, or bodily fluid type of a normal human control sample, wherein a change in measured BSG levels in said patient versus the normal human control is associated with a cancer which is progressing or regressing or in remission.

4. A method of monitoring breast cancer in a patient having breast cancer for the onset of metastasis comprising:

(a) identifying a patient having breast cancer that is not known to have metastasized;

5 (b) periodically measuring BSG levels in a sample of cells, tissues, or bodily fluid from said patient; and

(c) comparing the measured BSG levels with levels of BSG in cells, tissues, or bodily fluid type of a normal human control, wherein a change in BSG levels in the patient versus
10 the normal human control is associated with a cancer which has metastasized.

5. A method of monitoring the change in stage of breast cancer in a patient having breast cancer comprising:

(a) identifying a patient having breast cancer;

15 (b) periodically measuring BSG levels in a sample of cells, tissues, or bodily fluid from said patient; and

(c) comparing the measured BSG levels with levels of BSG in cells, tissues, or bodily fluid type of a normal human control, wherein a change in measured BSG levels in the
20 patient versus the normal human control is associated with a cancer which is progressing in stage, which is regressing in stage, or in remission.

6. The method of claim 1, 2, 3, 4 or 5 wherein the change associated with the presence, metastasis or progression
25 of breast cancer in said patient is an increase in measured BSG levels in the patient and the BSG comprises Mam001 (SEQ ID NO:2), Mam004 (SEQ ID NO:4 or SEQ ID NO:10) or Mam005 (SEQ ID NO:3).

7. The method of claim 1, 2, 3, 4 or 5 wherein the
30 change associated with the presence, metastasis or progression of breast cancer in said patient is a decrease in measured BSG

levels in the patient and the BSG comprises Mam002 (SEQ ID NO:1).

8. The method of claim 3 or 5 wherein the change associated with the regression or remission of breast cancer
5 in said patient is a decrease in measured BSG levels in the patient and the BSG comprises Mam001 (SEQ ID NO:2), Mam004 (SEQ ID NO:4 or SEQ ID NO:10) or Mam005 (SEQ ID NO:3).

9. The method of claim 3 or 5 wherein the change associated with the regression or remission of breast cancer
10 in said patient is an increase in measured BSG levels in the patient and the BSG comprises Mam002 (SEQ ID NO:1).

10. A method of identifying potential therapeutic agents for use in imaging and treating breast cancer comprising screening molecules for an ability to bind to BSG
15 or alter expression of BSG relative to BSG in the absence of the agent wherein the ability of a molecule to bind to BSG or alter expression of BSG is indicative of the molecule being useful in imaging and treating breast cancer.

11. An antibody which specifically binds a BSG wherein
20 said BSG comprises Mam001 (SEQ ID NO:2), Mam004 (SEQ ID NO:4 or SEQ ID NO:10) or Mam005 (SEQ ID NO:3).

12. A method of imaging breast cancer in a patient comprising administering to the patient an antibody of claim 11.

25 13. The method of claim 11 wherein said antibody is labeled with paramagnetic ions or a radioisotope.

14. A method of treating breast cancer in a patient comprising administering to the patient an antibody of claim 11.

15. The method of claim 14 wherein the antibody is 5 conjugated to a cytotoxic agent.

16. A method of treating breast cancer in a patient comprising administering to the patient a molecule which modulates expression or activity of BSG.

17. The method of claim 16 wherein the molecule 10 downregulates expression or activity of BSG comprising Mam001 (SEQ ID NO:2), Mam004 (SEQ ID NO:4 or SEQ ID NO:10) or Mam005 (SEQ ID NO:3).

18. The method of claim 16 wherein the molecule upregulates expression or activity of BSG comprising Mam002 15 (SEQ ID NO:1).

19. A method of inducing an immune response against a target cell expressing BSG comprising delivering to a human patient an immunogenically stimulatory amount of a BSG protein 20 so that an immune response is mounted against the target cell.